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Mr. M. J. Haney,
Mr. Lloyd Harris,
Mr. R. A. Ross, Commissioners,

Mr. J. H. W. Bower,
Mr. W. J. Francis,

Mr. H. G. Acres,)
Mr. P. A. Robertson) of H.E.P.C.

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Mr. H. G. Acres,)
Mr. F. A. Robertson) of H.E.P.C.

THE CHAIRMAN: Where are we to begin, Mr. Acres?

MR. ACRES: In regard to this proposal of Mr. Haney's about putting in railroad shovels and long trains with plows, and Mr. Harris was interested in that question what our principal unit costs would have been if we had been able to maintain the capacity of our shovels; and Mr. Gregory, you were interested in some information with regard to the reasons for the delay in getting the railroad crossing settled up; and Mr. Harris was interested in the questions that led to the original schedule (that was mentioned in that letter to Mr. Hearst) being exceeded by such a margin and causes that led to it having to do with the increased amount of work to be done after the date of that letter and other conditions. Mr. Haney was also interested in some original schedules for the work as originally laid out for a 6500 second-foot canal, and he was also interested in the various dates of completion of certain sections of the construction railway and the dates when we built trestles. Those are the principal points I recollect.

THE CHAIRMAN: Do you propose to take them up one by one?

MR. ACRES: Yes, what I have got. It is all under way but unfortunately I have not read that evidence. Somebody mentioned yesterday about the contractors being of the opinion that the job was "over-planted". Was that you, Mr. Harris?

COMMISSIONER LLOYD HARRIS: No, it was Mr. Gregory.

MR. ACRES: What gave rise to that discussion, do you remember, Mr. Gregory?

THE CHAIRMAN: I think the amount you had paid for plant in proportion to the work done was mentioned. I think it was about 33%, or

INTERVIEW WITH MR. H. G. ADKINS.

June 18, 1923.

Present:

Mr. W. D. Gregory, Chairman.
Mr. H. J. Henry,
Mr. Lloyd Harris,
Mr. E. A. Hoar, Commissioner.

Mr. J. H. W. Perry,
Mr. W. J. Francis,

Mr. H. G. Acres,
Mr. F. A. Robertson } of M.W.P.C.

THE CHAIRMAN: Where are we to begin, Mr. Acres?

MR. ADKINS: In regard to this proposal of Mr. Henry's about putting in reinforced concrete and long cranina with plums, and Mr. Harris was interested in that question went our principal unit costs would have been if we had been able to maintain the capacity of our sloveln; and Mr. Gregory, you were interested in some information with regard to the reasons for the delay in getting the railway crossing settled up; and Mr. Harris was interested in the question that led to the original schedule (that was mentioned in that letter to Mr. Barnet) being exceeded by such a margin and causes that led to it having to do with the increased amount of work to be done after the date of that letter and other conditions. Mr. Henry was also interested in some original schedules for the work as originally laid out for a 6500 second-foot canal, and he was also interested in the various dates of completion of certain sections of the construction railway and the dates when we built tunnels. Those are the principal points I remember.

THE CHAIRMAN: Do you propose to take them up one by one?

MR. ADKINS: Yes, what I have got. It is all under any but unfortunately I have not read that evidence. Somebody mentioned yesterday about the contractors having at the opinion that the job was "over-planned". Was that you, Mr. Harris?

COMMISSIONER LLOYD HARRIS: No, it was Mr. Gregory.

MR. ADKINS: What gave rise to that discussion, do you remember, Mr. Gregory?

THE CHAIRMAN: I think the amount you had paid for plant in proportion to the work done was mentioned. I think it was about 85%, or

was it 25%?

MR. HARRIS: The equipment according to the information we have was about $18,000,000.

MR. ACRES: That is just what I want to find out. That is an entirely erroneous basis. That $17,000,000. included not only what those contractors would have supplied but all the incidental expenditures such as camps, railway track overheads, small tools .....

THE CHAIRMAN: I think, Mr. Acres, we mentioned the amount of plant that was used for the excavation and concrete. Mr. Francis told us what that was — about $13,000,000?

MR. HANEY: That included your camps, etc.?

MR. BOWER: Mr. Francis took out the construction railway which reduced it to $12,000,000.

MR. ACRES: As I remember it the plant was valued at about $9,000,000.

THE CHAIRMAN: Have you read Mr. Francis' report on it?

MR. ACRES: No, not in full.

THE CHAIRMAN: The figures we quoted were taken from Mr. Francis' report we had before us at the time. Have you considered the amount of plant that should properly be charged to excavation and concrete?

MR. ACRES: I haven't it here, but I recollect it was something around $9,000,000.

MR. FRANCIS: The easiest way to get these would be —— I have many figures since then.

THE CHAIRMAN: Perhaps, Mr. Acres, you had better read over what was said in the discussion with Mr. Fraser before going into it.

MR. ACRES: I have two of those items developed: the discussion of the shovels and cars and the date of completion of the construction railway.

MR. HANEY: You have the plan showing the lay-out?

MR. ACRES: That does not show the lay-out of the railway, that simply shows the dates when various sections were completed.

MR. HANEY: You might have that tabulated?

MR. FRANCIS: That is all in Chapter "H".

MR. HANEY: Of course what I cannot understand is why a determined effort was not made at the start to get that distributing

was it ?$?$

MR. HARRIS: The equipment according to the information we have was about $30,000,000.

MR. ADKINS: That is just what I want to find out. That is an extremely expensive basis. That $17,000,000 included not only what the contractors would have supplied but all the incidental expenditure such as cranes, railway track overheads, small tools .....

THE CHAIRMAN: I think, Mr. Adkins, we mentioned the amount of plant that was used for the excavation and concrete. Mr. Francis told us what that was -- about $12,000,000.

MR. HARRY: What included your cranes, etc.?

MR. BOWEN: Mr. Francis took out the construction railway which reduced it to $12,000,000.

MR. ADKINS: As I remember it the plant was valued at about $5,000,000.

THE CHAIRMAN: Have you read Mr. Francis' report on it?

MR. ADKINS: No, not in full.

THE CHAIRMAN: The figures we quoted were taken from Mr. Francis' report we had before us at the time. Have you considered the amount of plant that should properly be charged to excavation and concrete?

MR. ADKINS: I haven't it here, but I recollect it was something around $5,000,000.

MR. MCLAUGHLIN: The easiest way to get those would be ---- I have many figures since then.

THE CHAIRMAN: Perhaps, Mr. Adkins, you had better read over what was said in the discussion with Mr. Fraser before going into it.

MR. ADKINS: I have two of those items developed; the discussion of the shovels and cars and the date of completion of the construction railway.

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MR. MCLAUGHLIN: That is all in Chapter "H".

MR. HARRY: Of course what I cannot understand is why a determined effort was not made at the start to get that distributing

MR. ACRES: There was a determined effort made.

MR. HANEY: Of course the progress estimates do not show it.

MR. ACRES: I know it. It simply could not be done; we had not the men nor the plant. By the end of 1920 we did not know from one day to another when we would get enough men to finish the job. We would get materials together for the job and start in on a week or ten days' job and we might work on it two days and the men would be taken to a more urgent job and that stuff would lie there. The Niagara, St. Catharines & Toronto bridge took about two years to build and it would have taken about 6 months if we could have kept the men on it.

Mr. Robertson is giving you some information today on the materials ordered, when ordered and when actually delivered.

THE CHAIRMAN: It just occurred to me about labor. How was it if you hadn't men you got men when labor conditions were much worse?

MR. ACRES: It was not until the fall of 1920 we really got sufficient men on the job. We began to see signs of loosening up of the labor market in midsummer of 1920, and in the fall of 1920 the returned soldier unemployment was at its height, and —— I would not say this in public evidence — but it was thought it was a public duty to make use of them. We took a lot of men on and from that time on men ——————

THE CHAIRMAN: And were they employed by you?

MR. ACRES: "Jack Canuck" was the most lurid publication in Canada from then on — some of the wildest letters about brutality and starvation and everything that could be thought of, but even then we could not have got any other men. Foreign labor had almost disappeared.

THE CHAIRMAN: Some of these farmers and others living nearby said it was impossible to keep men on the farms because of the inducements for work on the canal.

MR. ACRES: Calver had to sell his dairy herd, his bulls. He could not have afforded to pay farm men $5.00 a day. It is almost impossible now, after the lapse of three to five years, to give you anything like a real graphic picture of what the conditions were in 1920.

MR. HANEY: Of course your force account from time to time would show the number of men working and the machines working.

MR. ACRES: Yes; we are just talking generalities.

MR. HANEY: And if a machine was not manned you would not be working. I have looked over some of them and they were very complete.

MR. ACRES: Yes, and in some cases we had to put twice as many men on the machines as was necessary. On all those shovels we

MR. ADAMS: There was a determined effort made.

MR. HARNEY: Of course the progress estimates do not show it.

MR. ADAMS: I know it. It simply could not be done; we just let the men run the plant. By the end of 1930 we did not know from one day to another when we would get enough men to finish the job. We would get materials together for the job and start in on a week or ten days' job and we might work on it two days and the men would be taken to a more urgent job and that story would lie there. The Niagara, at Gardiner's Torrens bridge took about two years to build and it would have taken about 6 months if we could keep the men on it.

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THE CHAIRMAN: It just occurred to me about labor. How was it it wasn't when you got men when labor conditions were much worse?

MR. ADAMS: It was not until the fall of 1930 we really got unfilled men on the job. We began to see signs of loosening up of the labor market in midsummer of 1930, and in the fall of 1930 the returned soldier unemployment was at its height, and —— I would not say this in public evidence — but it was thought it was a public duty to take use of them. We took a lot of men on and threw them on men ————

THE CHAIRMAN: And were they employed by you?

MR. ADAMS: "Back Germany" was the most lurid publication in Canada from then on — some of the wildest letters about brutality and starvation and everything that could be thought of, but even then we could not have got any other men. Foreign labor had almost disappeared.

THE CHAIRMAN: Some of those farmers and others living nearby said it was impossible to keep men on the farms because of the inducements for work on the canal.

MR. ADAMS: Carpenters to split pine dairy land, pile piles. We could not have afforded to pay farm men $5.00 a day. It is almost impossible now, after the lapse of three to five years, to give you anything like a real graphic picture of what the conditions were in 1929.

MR. HARNEY: Of course your farms account from time to time would show the number of men working and the machines working.

MR. ADAMS: Yes; we are just talking generalities.

MR. HARNEY: And if a machine was not manned you would not be working. I have looked over some of them and they were very complete.

MR. ADAMS: Yes, and in some cases we had to put twice as many men on the machines as was necessary. On all those shovels we

had to use 8 pitmen where 4 were necessary, and I have seen time and time again when a shovel would be left idle until we could bring up a gang, and we gave those particular pitmen 3 cents an hour more than laborers and allowed 11 hours for 10 hours' work and they practically spit in our faces.

MR. HANEY: And them did not work?

MR. ACRES: No. Two men would carry a tie, and believe me those men could deal pallbearers cards and spades and show them up.

MR. HANEY: Donnelly according to his evidence was quite a time with you?

MR. ACRES: That old Irishmen; I don't know how long he was with us.

MR. HANEY: He was there quite a while and he claims there were no extraordinary difficulties. He was about the only man you had who was actually in charge of a shovel. He was a miner by trade; I think he did some work for me.

MR. ACRES: That man Rutter was the shovel man longest on the job ———

I have a few notes on the proposal that the Commission should have used railway type shovels, etc.

Mr . Acres then read from notes which he had prepared, as follows:-

"For the purposes of discussion, it will be assumed that a 78-C Bucyrus Shovel fills the specifications for shovel equipment. Ten of these shovels, having an average capacity of 2,000 cubic yards of earth per ten hours, would about equal the estimated capacity of the original equipment actually provided for this work.

"The cars are assumed to be flat cars with hinged side doors, and since it had been suggested that the H.E.P.C. should have used the maximum size of standard car available, it is taken to mean that the size proposed should have about 30 cubic yards capacity. A car of this capacity, however, will have to have a floor space of 34' x 9' in order to take a load of 30 cubic yards of dry material, with slopes of 1-1/2 to 1, and will weigh very close to 30,000#.

"It will therefore be assumed that the capacity is 30 cubic yards and the weight will be taken as 30,000# for each car.

"The length over all for the proposed car will be about 39 ft. and a train of 25 cars, including engine, will be over 1,000 ft. long. This length car will be hard to keep on the track when curves may reach 30 degrees as is often necessary for construction purposes.

MR. HANEY: I was speaking particularly of this stripping for those cars. What do you mean by stripping the overburden?

MR. ACRES: That statement applies.

MR. ACRES: "For ten shovels there should be two trains per shovel, and with the spares, a total of approximately 600 cars necessary, as the number of cripples is excessive where unloaders and plows are used, even where the material is dry and free - flowing, like gravel".

The point there is that where you have free flowing material like gravel or sand you can get your best efficiency out of a plow, but where you have boulders or the kind of material that we had there, even assuming that it would hold in one of those cars, by the time it consolidated it would flow out or push out in a solid mass and you would likely have a lot of broken doors or posts.

MR. HANEY: I don't think so.

MR. ACRES: And where you get boulders you don't dig, you must move.

MR. HANEY: You don't have to move boulders in that stripping?

MR. ACRES: Of course we got a good many. We had to take that material as it came.

MR. HANEY: What is usually done with boulders; they are pushed aside and a hole put in them so that they can be easily handled.

MR. ACRES: I think in a case where they strike a pit where there are a lot of boulders they just move.

MR. HANEY: There were not many boulders in that excavation?

MR. ACRES: Yes, but there might have been. I think we laid out the type of construction before a yard of dirt had been dug. There is the point there.

MR. HANEY: There is no point there.

MR. ACRES: Over on the Canal, Porter is using plows on the clay. His cars lasted about 4 days. He put steel sills in them and used 60-lb. rails for his posts before he could get a car that would stand up at all, and that was with clay. He was only using 16-yard cars. We might have had the same trouble that he had in getting the stuff under our doors. If he had had 20-yard cars on that job he would not have had the trouble. He had ideal conditions for a plow.

reading: "At the disposal ground there should be 2 plows and one unloader for each shovel, in order to avoid delays of waiting for this sort of equipment. The 2 plows will be one right-hand and one left-hand, or, say 22 plows in all for 10 shovels and 11 unloaders.

"The above represents the equipment directly connected with excavation and does not include any provision for auxiliary needs, as hoists, wrecking cranes, other locomotives and cars, snow-

plows, pumps, etc."

MR. HANEY: Why not use the central plows?
MR. ACRES: I don't know.
MR. HANEY: I do.
MR. ACRES: It was the kind of ground we had to fill in.
MR. HANEY: I am not arguing that.
MR. ACRES: It is a matter of fact.
MR. HANEY: It is a matter of knowledge in my case too.

reading: —— "It may be fairly conceded that the location of the main disposal area was the most logical and suitable, especially in consideration of the requirements that such a ground should have to meet. A disposal area for this work, that will satisfactorily fill all requirements, should have the following principal characteristics:—

1 - Convenience to the centre of gravity of the excavation,
2 - Suitable depth to provide for the maximum practical spoil per unit of area, avoiding frequent track shifting, etc.,
3 - Sufficient area to provide for the disposition of approximately 17,000,000 cubic yards of excavated material,
4 - Accessibility,
5 - Minimum first cost and minimum prospective damages to adjoining properties.

"The area as selected is less than two miles from the main line of the construction railway, parallel to the canal, and about four miles from the centre of gravity of the total excavated.

"It has an average depth of 65 feet over an area of 200 acres thus providing ample space for at least 18,000,000 cubic yards of excavation. It is accessible from the main line of the construction railway without crossing any of the existing steam or electric railways, and its location provides for a safe operating gradient for the disposal railway leading to it. The land on which the disposal is located was for the greater part undeveloped and contiguous to similar properties. Drainage is excellent and no claims for damages have been made to date."

(B) - It will also be seen that with 150 to 200 train movements per day across the Grand Trunk, Michigan Central, Wabash and N.S. & T. Railways, grade crossings with these roads were out of the question. Of these crossings the Wabash was the least active, with a regular service of 14 to 15 trains per day, and during the war, an extra traffic of about 15 war special passenger trains per week.

MR. ACRES: Now that was really one of the factors that had to do with our equipment. We had these railways here. We did not consider it was possible for a minute to consider grade crossings on those railways.

MR. HANEY: I think you were right enough there. You had to get down anyway; it was only in excavating at the "Y" there, that was the

additional expense.

MR. ACRES: The grade of these under crossings was then the ruling grade to the disposal areas. 4/10 of 1%. Up to this point (indicating) we would have been in a 35-foot cut and we would have taken about 35 feet off the top of our disposal. It would have cut our disposal capacity.

MR. HANEY: Where is the profile of that, have you a profile of that?

MR. ACRES: I don't think you have it.

MR. HANEY: You have one?

MR. ACRES: Yes, I will bring it down.

THE CHAIRMAN: If you had reduced the grade you would have reduced the disposal area 35 feet?

MR. ACRES: Yes. 1/2 of 1% in the gradient from the "Y" would have cut off 25 feet from the top of our dump. It would be over half because the upper strata of that dump has the most yardage in it on account of the slope. As you go down your capacity decreases due to the toe of the slope going out.

Reading: —— "Upon examination of the profile of the disposal railway connecting the main line of the construction road with the disposal grounds and restricted by the controlling conditions A and B of railway crossings and dump location, it will be fairly established that, to reach the disposal area with 1/2 of 1% grade would be an impossibility on practical and economical grounds, especially when the grade is against the loaded traffic. This ruling grade would also be a condition prevailing on north and south bound traffic on the main line tracks, as undoubtedly it would frequently be necessary to operate loaded trains in either direction. The profile of the ground, together with the location and grades of the railroads crossing the canal and construction railway, will show that to establish this gradient would involve excessive cuts and fills both north and south of Lundy's Lane and result in difficulties in making connections to service and loading tracks along the canal."

MR. HARRIS: Did you know in January, 1917, where your disposal areas were going to be?

MR. ACRES: Yes.

MR. HARRIS: Did you have this information before you at that time?

MR. ACRES: Yes, in 1917.

MR. HARRIS: And yet in the face of that you made that estimate.

MR. ACRES: What do you mean?

MR. HARRIS: The estimate for the original work.

maintenance expense."

ED. ADAMS: The people of Lenox nearly overlooked the value the rolling grade in the Lenox Hills. Only by [illegible] By is this point [illegible] tual we would have been in an up-close era and we would have [illegible] do that and the top of the Eighties. It would have run over [illegible] project."

JO. KEATS: Where is the results of that, have you a picture of that

TH. ADAMS: I don't think you have it.

TH. KEATS: You have

ED. ADAMS: Yes, I will bring it down.

TED CHATTERS: If you had removed the grade for small cars instead the diagonal cars it would

ED. ADAMS: Yes. It's to the pendant that the [illegible] act to that edge of the street. It would be much [illegible] be at the top of the hill. [illegible] the [illegible] [illegible] [illegible]

MR. ACRES: Yes. What do you mean "in the face of it?"

MR. HARRIS: Why did you want to put in an estimate for $14,000,000. if you knew of the difficulties you would have to contend with?

MR. ACRES: I am not discussing difficulties now, but I am discussing two different proposals as to how the disposal should have been handled.

MR. HARRIS: It all had to do with the cost?

MR. ACRES: Yes.

MR. HARRIS: It was all figured in the estimate of cost that was made in January, 1917?

MR. ACRES: There was no estimate made in January, 1912. It was in 1916. The only estimate made in 1917 was that estimate in the big report of mine.

MR. HARRIS: The estimate in the letter to Sir William Hearst was in January, 1917?

MR. ACRES: Of course that was the estimate made in the year before. I think Mr. Francis' reports show the details of that estimate and the estimate provided for the construction railway. This is not a discussion of cost; this is a discussion of method and I don't think there is anything out of the way about it. Those are the things we have to discuss in figuring out an engineering thing like this; there is nothing abnormal about it.

MR. HARRIS: Well there is something abnormal about it.

MR. ACRES: The abnormality came afterwards. There was nothing abnormal; it was just a big job. The only abnormal thing was the removal of that immense depth of overburden and we considered we solved that by putting on the heavy shovels. We thought we knew a good deal of what was under the overburden. We found out all we could find about it on the basis of preliminary conception but there was a lot in it that we could not forsee.

Reading: "With shovels working south from the forebay, it is taken that, in order that the shovels may work to their maximum depths in cuts, both the leads to the main line and the loading tracks are on 1/2 of 1% grade, or equivalent. The building of zig-zag lines up the slopes does not appear to be practical, considering that there are ten shovels working all in the same direction and at all points long the line, and when the trains to be handled are over 1,000 feet long.

"Shovels working in this way are in the first place operating against drainage and in the second place, will reach their limit of depth of excavation at about 25 feet below ground for the loading tracks at approximately station 340, or at the north side of the Whirlpool Gully.

"Below this depth the grade of 1/2 of 1% will strike rock formation near station 390 and it would be impossible to locate a loading track elsewhere to serve a shovel at that station and at that depth of cut. Neither is there room to switch a 1,000 ft. train even on zig-zag tracks in order to reach the main line."

(Referring to photo on page H-101, Mr. Francis' report on Excavation in Canal) - This shovel is working against an 80-foot face. Instead of absorbing this 80-foot lift with transportation plant we absorbed that 80-foot lift with digging plant. That was just the distinction between this method and the method Mr. Haney advances.

THE CHAIRMAN: How deep was the rock below the surface where the shovel was?

MR. ACRES: We never got rock there. Our core drills were down over 200 ft. That was the total depth of the canal at that point. This shovel was digging about 8 feet below grade at that point and the rock was thrown in.

Reading: —— "Between Station 210 and 240 it would be impossible to get out with a 1,000 foot train, with cars loaded by shovels having a 10-ft. range between shovel and loading track. At these and other points where rock surface projects it would become necessary to increase the trades and load short trains. To start a 25-car train loaded with 30 cubic yards on each car, requires a draw-bar pull of at least 56,000 lbs, shown by the analysis given below.

"The weight of 30 cubic yards of excavation is approximately 40.5 tons and the car 15 tons. A full train of 25 cars will be over 1,400 net tons. With loading track on 1/2 of 1% grade and dirt on the rail, to start the train will require not less than 40 lbs. of draw-bar pull for each net ton of trainload (cars and loads included) or a total draw-bar pull of 56,000 lbs. With an adhesion co-efficient of 22% this calls for a weight of 254,545 lbs. on the drivers of the locomotives or approximately 127 tons, which is a weight far beyond the safe loading limit on construction tracks at dumps and shovels. (At that particular place we had to build a mile of trestle ahead of that shovel - 4-pile bents with cap. We would not have taken a chance on anything heavier than a 50-ton locomotive on that track).

"These long trains also entail extensive trackage, requiring a long tail tracks both at shovels and dumps. The conditions under which the proposed units could be utilized may be given in general as follows:—

1 - That the material excavated is dry and will load on cars with slopes of 1-1/2 to 1,
2 - That the dump or disposal tracks are on tangents, in order that the unloader and plows will work,

3 - That unusually long tracks are needed both at dump and to provide for switching, routing of handling unloader and plows, and loading and unloading.

MR. ACRES: As a matter of fact pretty nearly every foot of the material taken out was of a kind that it would not load on those cars at all. It was simply sloppy stuff that would have dropped out over the draw boards for you would not have held it even with those tight 20-yard dumps. They tell me they had to keep a gang of 30 men on the "Y" and disposal dump to keep the material off the tracks, and in the end we got so much into the ditches we had to put on a dragline to dig it out. With your hinged door frame cars there would not have been anything left in the cars. It would have rolled out as fast as dumped in.

4 - (reading) "Another condition is that an average of at least 60 minutes would be needed to unload and release train at the dump, the details of which are given in the following statement:

(a) - Upon arrival of the train at the disposal it is coupled to the plow standing on its spur.....3 minutes.
(b) - The engine uncoupled and goes for unloader standing on its spur.....5 "
(c) - Engine and unloader return and coupled to train.....3 "
(d) - Train moved so that unloader is under the cable arm of anchor and cable attached to arm.....5 "
(e) - Train moved forward unreeling cable until plow is opposite arm and cable attached to plow.....5 "
(f) - Train taken to dump.....5 "
(g) - Train unloaded, plow now next to unloader.....20 "
(h) - Empties placed on siding..... 3 "
(i) - Plow taken to spur and cable detached from it..... 5 "
(j) - Unloader taken to spur..... 5 "
(k) - Engine returns and couples to empties... 5 "

Total time.....64 minutes.

5 - "That shorter trains, heavier gradients and lighter locomotives would be necessary to remove the entire earth cut even though it were dry.

Sixty-four minutes, leaving out schedule, required to unload one of those 25-car trains. There are 11 operations we had to go through on that dump to unload one of those trains even assuming you had a straight tangent and no high spots in your contour so that you could dump the train uniformly over the whole dump.

Reading: — "Under this routine and system of unloading it will be very difficult to widen the dump at the deep and extreme ends of

the tracks, for in the first place the yardage per foot of train is smaller, the dump length per train is long, and the plow car being on the end of the train materially shortens the dump each time the track is shifted. This difficulty arises from the restfictions due to the varying depths of fill and the limits to dump ground area. To widen, it would require that the train be very frequently cut with its attendant delays due to switching out empties, etc.

"Should a slide occur on the dump it could not be filled with this equipment, since it will not work when the dump track is on a curve. When the material is unloaded by plow it falls close to the rail and makes operation of train difficult and detailments frequent.

"A marked increase in dump force would be needed in order to attend long trains, and for long periods in which the trains are unloading and switching.

"This system of handling excavated material is restricted largely to placing ballast on main line tangents or very flat curves and making railroad fills from the trestle where the original dump track is not moved and where the tail track is thus unlimited. It was at one time the recognized method of disposing of earth excavation only on railroad fills, but is now generally superseded by the use of air dump cars. One company's products of dump cars are now in use on 55 prominent railroads of Canada and the United States.

"To do the entire excavation in both rock and earth on the canal would, if the earth excavation had been made as proposed, have entailed the equipping of the work with two totally distinct types of excavating plant; one for earth and another for rock."

MR. HANEY: I want to see the contour lines of the country and a profile of the connection with the main line along the canal and where you branch out, a plan showing that and the profile showing it.

MR. ACRES: There is another thing: You mentioned the fact about had we taken another year to complete the work instead of jamming it through in 1921. In that additional year it would have taken to finish the work the Queenston plant turned out 500,000,000 K.W.H. What would you consider a fair coal equivalent, Mr. Ross? Some of that would be used on economies of 1-1/2 lbs. per horsepower-hour. About 9 tons per horsepower-year for this district would be about right.

MR. R. A. ROSS: Somewhere about that, according to the uses for which it is put varying from big plants where you could get 1-1/2 to plants where you have been getting 5 and 6 lbs.

MR. ACRES: It would be only for fairly high economy steam plants.

THE CHAIRMAN: When you say 9 lbs. a horsepower is that for 24 hours or for a 10-hour day?

MR. R. A. ROSS: Nine tons per year.

THE CHAIRMAN: Was it a fact or not, Mr. Acres, that the demand for power for manufacturing fell off considerably in 1919?

MR. ACRES: It fell off in 1919 for a short time after the Armistice and then began to climb.

THE CHAIRMAN: When did it fall off again for manufacturing purposes?

MR. ACRES: I don't know. All I know is just the increases in the station load which has kept on climbing.

MR. HARRIS: But I think you will find the increase was not brought about by manufacturing.

MR. ACRES: It was power that was used that would have to be supplied.

MR. HARRIS: It was power used for purposes of luxury rather than necessity.

MR. R. A. ROSS: But the demand for stoves, etc., was taking the place of not only 9 tons per year but about 50.

THE CHAIRMAN: I suppose you could have taken into consideration the price you would have paid for power that would have taken the place of this generated power. You bought power?

MR. ACRES: That just covered the time when they began to take power away from us.

THE CHAIRMAN: When was the Canadian Niagara power available?

MR. ACRES: It was available from July 1st, 1921, to the first January, 1922, about the time we started the Queenston plant.

THE CHAIRMAN: It was available in 1922 as well?

MR. ACRES: No, it was not.

THE CHAIRMAN: How was it you got it from the time of the accident?

MR. ACRES: I don't know; we did not get very much.

THE CHAIRMAN: I thought you got 50,000 from them at that time?

MR. ACRES: I don't know, but in addition to the emergency power we had a contract for 50,000 and shortly after that they cut off all but the 50,000.

THE CHAIRMAN: I thought there was some surplus available in 1922.

MR. ACRES: No. They let us down right in the middle of 1922. They began cutting off our firm contract. They cut off 10,000, then another 10,000. Before the end of 1920 we were cut down to 20,000 in a 50,000 h.p. allotment. That was power we were getting through the war; it was part of our base load supply.

MR. ACRES: In the latter part of 1918, 1919 to mid-summer, 1920, we lost fully a year of our original anticipated rush schedule. That was because we could not get the labor we needed, the kind of labor we needed, and when we got material it was not the kind we wanted.

MR. HANEY: Was the material too a year short?

MR. ACRES: It was not so much shortage insofar as we were short when they failed to deliver.

MR. HANEY: What kind of material would that be?

MR. ACRES: That would be miscellaneous parts, ties, railroad material, wires, cables. We did not get a decent cable or a decent shovel chain. All the reinforcing steel we could get was some rejected....

MR. HANEY: You were not using much reinforcing steel then?

MR. ACRES: In 1918 and 1919 we certainly were using a lot. We were building all our bridges then - or at least trying to.

MR. HANEY: You feature being short of material, I would like to have some idea of just what materials you were short. Repair parts you speak of — they were essential.

MR. ACRES: I have a list here; I will have that typed for you.

MR. HARRIS: In 1919 there was a ~~lot~~ great deal of difficulty because everybody was over their war contracts and peeking around for contracts.

MR. ACRES: They were not in the States, unfortunately.

THE CHAIRMAN: Why were they not in the States, because there the demand fell off at that time?

MR. ACRES: I can't tell you. I can't see how if the demand for material fell off why the labor costs kept sky-rocketing.

MR. HARRIS: The increase in labor started in the latter part of 1919 and in the early part of 1920.

MR. ACRES: When labor was being paid the price it was paid at that time it would seem to indicate a shortage of labor. Material costs were high and that would seem to indicate a shortage of material. That was the most expensive period.

MR. HARRIS: Well, I know, but materials that had been ordered in 1918 on the basis of deliveries at that time, and each year people over here had to buy ahead for a year or 18 months, and the material piled in on them in 1918. That was what put everybody to the bad. In 1920 it was a bad year.

MR. ACRES: There is a sketch (blueprint) Mr. Haney, showing a possible way of taking out that 70-ft. cut.

MR. HANEY: I am in sympathy with factory workers getting an 8-hour day, but I am not in favor where you have outside construction and you must contend with the elements.

MR. ACRES: We showed these fellows in the spring of 1920 that with a reduction of 20% in the working time we got a reduction of 40% working efficiency. Inside of one week we had only one shovel working in rock and we gave a week's test and we found she fell off 40% in production due to a shortage of 20% in time.

THE CHAIRMAN: I should think there would be some classes of outside work where 9 hours would be enough?

MR. HANEY: None whatever. The ordinary worker is held up by contingencies. I don't think the skilled man works more than 8-1/2 to 9 hours a day.

THE CHAIRMAN: What are you paying common labor per hour?

MR. ACRES: Forty cents. They are paying 45 to 60 across the river, and 75 cents in Buffalo.

THE CHAIRMAN: What is your payroll now for the Chippawa work and the number of men?

MR. ACRES: About 700 men.

THE CHAIRMAN: Does that include the men at the power house?

MR. ACRES: Includes everybody: men on construction work and at the power house.

THE CHAIRMAN: How many men will be employed on the canal and in the power house when the work is completed and in full operation?

MR. ACRES: I don't know. I should say 50 men.

MR. HARRIS: Fifty men on each shift?

MR. ACRES: No, 50 altogether.

THE CHAIRMAN: That seems small.

MR. ACRES: Our operation cost now runs about $7,000. a month.

THE CHAIRMAN: Is that all?

MR. ACRES: Which is a matter of cents per horsepower.

THE CHAIRMAN: And all the rest of it is being charged to capital?

MR. ACRES: Roughly, the force would be this:

2 - men at the Intake (alternate shifts),
2 - patrolmen on the canal,
2 - men on the control gate,
2 - men at the gatehouse,
6 - elevator men,
9 - men in control room (3 shifts),
6 - men on the governors (3 shifts),
6 - men on the turbine deck (3 shifts),
10 - mechanics (one shift)

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THE CHAIRMAN: Have you covered all the ground?

MR. ACRES: Except that I want to elaborate them. These other points are being worked out. Mr. F. A. Robertson is giving you some information today of the railroad costs. I have not had a chance to look at it. The delay on the delivery of plant is being worked out; the time of completion on the original schedule is being worked out, and the completion of the construction railway, that will be a matter of amplifying this. That stuff will all be ready in a day or two.

THE CHAIRMAN: Mr. Bower has some questions which he will let you have later. When will you be ready to take it up with us again, Mr. Acres?

MR. ACRES: Would it be all right if I let Mr. Bower know?

THE CHAIRMAN: Yes.

2 - man at the lathe (alternate shifts).
2 - patrolman on the canal.
2 - man on the control gate.
2 - man at the gatehouse.
6 - clevasco men.
3 - men in control room (3 shifts).
6 - men on the governors (3 shifts).
6 - men on the turbine deck (3 shifts).
10 - mechanics (one shift)

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THE CHAIRMAN: Have you covered all the ground?

MR. ADAMS: Except that I want to elaborate them. Those other points are being worked out. Mr. X. Robertson is giving you some information today of the railroad costs. I have not had a chance to look at it. The delay on the delivery of plant is being worked out; the time of completion on the original schedule is being worked out, and the completion of the construction railway, that will be a matter of amplifying this. That study will all be ready in a day or two.

THE CHAIRMAN: Mr. Power has some questions which he will let you have later. When will you be ready to take it up with us again, Mr. Acrest

MR. ADAMS: Would it be all right if I let it, Mower know?

THE CHAIRMAN: Yes.